Data Sheet

Cisco Catalyst 2970 Series Switches

The Cisco® Catalyst® 2970 Series Switches are affordable Gigabit Ethernet switches that deliver wire-speed intelligent services for small and medium businesses and enterprise branch offices. Featuring a complete set of intelligent services, the Catalyst 2970 Series Switches can enhance network performance and increase productivity for today's knowledge workers by intelligently scaling beyond 100 Mbps over existing Category 5 copper cabling.

The Cisco Catalyst 2970 Series is part of the industry's most complete range of stackable and standalone switches, including the Cisco Catalyst 2940, 2950, 3550, and 3750 Series Switches. Cisco's suite of fixed configuration switches provides Fast Ethernet and Gigabit Ethernet configurations with intelligent services to small and medium-sized businesses and enterprise branch offices.

Cisco fixed configuration switches are part of a larger family of Cisco Catalyst switches that include the Cisco Catalyst 6500 and 4500 Series modular switches. The entire family offers industry-leading performance, functionality, scalability, and flexibility.

Configuration

The following two configurations comprise the Cisco Catalyst 2970 Series:

- Cisco Catalyst 2970G-24TS—24 Ethernet 10/100/1000 ports and 4 small form-factor pluggable (SFP) ports
- Cisco Catalyst 2970G-24T—24 Ethernet 10/100/1000 ports

Available with Cisco Enhanced Image (EI) IOS® Software, the Cisco Catalyst 2970 Series offers a complete set of intelligent multilayer services to deliver security, quality of service (QoS), and availability with the simplicity of traditional LAN switching. Features such as Identity Based Network Services and multilayer QoS capabilities bring security to the edge of the network while enabling applications such as IP telephony and real-time streaming ultimedia.

Figure 1
Cisco Catalyst 2970 Series Switches

All contents are Copyright © 1992–2003 Cisco Systems, Inc. All rights reserved. Important Notices and Privacy Statement.

Gigabit Ethernet

Today's knowledge workers are placing higher demands on their networks. They need to run multiple, concurrent applications, and to do this productively, these users require higher bandwidth from the network. For example, a worker joins a team conference call via IP videoconference, sends a 10-MB spreadsheet to meeting participants, broadcasts the latest marketing video for the team to evaluate, and queries the customer relationship management database for the latest real-time feedback. Meanwhile, the multigigabyte system backup starts in the background and the latest virus updates are pushed to the client. Bandwidth enhancement beyond 100 Mbps—enabled by Gigabit Ethernet—provides for a smoothly operating network with the ability to evolve.

Cisco makes the transition to Gigabit Ethernet faster and easier with standards-based solutions for both fiber and copper cabling. At speeds of 1000 Mbps, Gigabit Ethernet provides the bandwidth that networks need to meet new and evolving network demands, alleviate bottlenecks, and boost performance while increasing the return on existing infrastructure investments. Small and medium-sized networks with Cisco Catalyst 2950 Series switches deployed in the access layer will find the Cisco Catalyst 2970 Series a cost-effective switch platform with which to begin the migration to Gigabit Ethernet.

Intelligence in the Network

As companies increasingly rely on the network as the strategic business infrastructure, and with end users having 1000Mbps at their disposal, it is more important than ever to consistently ensure network security, high availability, and QoS—from the desktop through the network core and out to the WAN.

Cisco Catalyst switches enable companies to realize the full benefits of adding intelligent services into their networks. These capabilities make the network infrastructure

- secure to protect confidential information,
- highly available to deliver on time-critical needs,
- scalable to accommodate future growth, and
- capable of differentiating and controlling traffic flows to handle the increasing number of critical business applications.

Enhanced Security

With the wide range of security features that the Cisco Catalyst 2970 Series offers, businesses can protect important information, keep unauthorized people off of the network, guard privacy, and maintain uninterrupted operation.

The Identity-Based Networking Services (IBNS) feature in the Cisco Catalyst 2970 Series prevents unauthorized access and helps to ensure that users get only their designated privileges. It provides the ability to dynamically administer granular levels of network access. Using the 802.1x standard and the Cisco Secure Access Control Server (ACS), users can be assigned a virtual LAN (VLAN) or an ACL upon authentication, regardless of where they connect to the network. This allows IT departments to enable strong security policies without compromising user mobility—and with minimal administrative overhead.

All contents are Copyright © 1992–2003 Cisco Systems, Inc. All rights reserved. Important Notices and Privacy Statement.

To guard against denial-of-service and other attacks, ACLs can be used to restrict access to sensitive portions of the network, blocking unauthorized access to servers and applications, by denying packets based on source and destination MAC addresses, IP addresses, or Transmission Control Protocol/User Datagram Protocol (TCP/UDP) ports. ACL lookups are done in hardware, so forwarding performance is not compromised when implementing ACL-based security.

Port security can be used to limit access on an Ethernet port based on the MAC address of the device that is connected to it. It can also limit the total number of devices plugged into a switch port, reducing the risks of rogue wireless access points or hubs.

Secure Shell (SSH), Kerberos, and Simple Network Management Protocol Version 3 (SNMPv3) encrypt administrative and network management information, protecting the network from tampering or eavesdropping. Terminal Access Controller Access Control System (TACACS+) and Remote Access Dial-In User Service (RADIUS) authentication enable centralized access control of switches and restrict unauthorized users from altering the configurations. Alternatively, a local username and password database can be configured on the switch itself. Fifteen levels of authorization on the switch console and two levels on the Web-based management interface provide the ability to give different levels of configuration capabilities to different administrators.

The MAC Address Notification feature can be used to monitor the network and track users by sending an alert to a management station so that network administrators know when and where users entered the network. The Dynamic Host Configuration Protocol (DHCP) Interface Tracker (Option 82) feature tracks where a user is physically connected on a network by providing both the switch and the port ID to a DHCP server.

The Private VLAN Edge feature isolates ports on a switch, helping to ensure that traffic travels directly from the entry point to the aggregation device through a virtual path and cannot be directed to another port.

High Availability

The Cisco Catalyst 2970 Series offers several high-availability features to reduce network downtime, maintain mission-critical applications, and reduce total cost of ownership.

Enhancements to the standard Spanning-Tree Protocol, such as Per-VLAN Spanning-Tree Plus (PVST+), UplinkFast, and PortFast maximize network uptime. PVST+ allows for Layer 2 load sharing on redundant links to efficiently use the extra capacity inherent in a redundant design. UplinkFast, PortFast, and BackboneFast all greatly reduce the standard 30-to-60-second Spanning-Tree Protocol convergence time. Loop Guard and Bridge Protocol Data Unit (BPDU) Guard provide Spanning-Tree Protocol loop avoidance.

Customers can achieve maximum power availability for a converged voice and data network when a Cisco Catalyst 2970 Series Switch is combined with the Cisco Redundant Power System (RPS) 675 for seamless protection against internal power supply failures.

Advanced QoS

The Cisco Catalyst 2970 Series offers superior multilayer, granular QoS features to avoid congestion and help ensure that network traffic is properly classified and prioritized. Configuration of QoS is greatly simplified through Automatic QoS (AutoQoS), a feature that detects Cisco IP phones and automatically configures switches for the appropriate classification and egress queuing. This optimizes traffic prioritization and network availability without the challenge of complex configuration.

All contents are Copyright © 1992–2003 Cisco Systems, Inc. All rights reserved. Important Notices and Privacy Statement.

The Cisco Catalyst 2970 Series can classify, police, mark, queue, and schedule incoming packets, and can queue and schedule packets at egress. Packet classification allows the network elements to discriminate between various traffic flows and to enforce policies based on Layer 2 and Layer 3 QoS fields.

To implement QoS, the Cisco Catalyst 2970 Series Switch first identifies traffic flows or packet groups, and classifies or reclassifies these groups using the Differentiated Services Code Point field (DSCP) or the 802.1p class-of-service (CoS) field. Classification can be based on criteria as specific as the source/destination IP address, source/destination MAC address, or the Layer 4 TCP/UDP port. At the ingress, the Cisco Catalyst 2970 will also police to determine whether a packet is in or out of profile, mark to change the classification label, pass through, or drop out of profile packets, queue packets based on classification, and service based on configured weights. Control plane and data plane ACLs are supported on all ports to ensure proper treatment on a per-packet basis. The Cisco Catalyst 2970 Series Switch supports four egress queues per port, which allows the network administrator to be discriminating and specific in assigning priorities for the various applications on the LAN. At egress, the switch performs scheduling and congestion control. Scheduling is a process that determines the order in which the queues are processed. The Cisco Catalyst 2970 Series Switch supports Shaped Round Robin (SRR) and strict priority queuing. The SRR queuing algorithm helps to ensure differential prioritization.

Management

Express Setup is a new feature that simplifies initial configuration of a switch. Users now have the option to set up the switch through a Web browser, eliminating the need for more complex terminal emulation programs and knowledge of the command-line interface (CLI). Express Setup reduces the cost of deployment by enabling less-skilled personnel to quickly and simply set up switches.

Embedded in Cisco Catalyst 2970 Series switches is the Cisco Cluster Management Suite (CMS) Software, which allows users to simultaneously configure and troubleshoot up to 16 Cisco Catalyst desktop switches—regardless of their physical location—using a standard Web browser. Cisco CMS Software provides an integrated management interface for delivering intelligent services such as multilayer switching, QoS, multicast, and security ACLs. Cisco CMS Software allows administrators to take advantage of benefits formerly reserved for only the most advanced networks, without having to learn the CLI or the details of the technology. The new Guide Mode in Cisco CMS Software leads the user step-by-step through the configuration of advanced features and provides enhanced online help for context-sensitive assistance. In addition, Cisco AVVID (Architecture for Voice, Video and Integrated Data) wizards provide automated switch configuration to optimally support video streaming or videoconferencing, voice over IP (VoIP), and mission-critical applications. These wizards can save hours of time for network administrators, eliminate human errors, and help to ensure that the configuration of the switch is optimized for these applications.

In addition to Cisco CMS Software, Cisco Catalyst 2970 Series switches provide for extensive management using SNMP network management platforms such as CiscoWorks for Switched Internetworks. Managed with CiscoWorks, Cisco Catalyst switches can be configured and managed to deliver end-to-end device, VLAN, traffic, and policy management. Coupled with CiscoWorks Cisco Resource Manager Essentials, a Web-based management tool, offers automated inventory collection, software deployment, easy tracking of network changes, views into device availability, and quick isolation of error conditions.

All contents are Copyright © 1992–2003 Cisco Systems, Inc. All rights reserved. Important Notices and Privacy Statement.

Product Specifications

Table 1 Product Features and Benefits

Feature	Benefit
Ease of Use and Ease of Deployment	• Express Setup simplifies initial configuration via a Web browser, eliminating the need for more complex terminal emulation programs and CLI knowledge. • DHCP autoconfiguration of multiple switches through a boot server eases switch deployment. • AutoQoS simplifies QoS configuration in VoIP networks by issuing interface and global switch commands to detect Cisco IP phones, classify traffic, and enable egress queue configuration. • Autosensing detects the speed of the attached device and automatically configures each 10/100/1000 port for 10-, 100-, or 1000-Mbps operation, easing switch deployment in mixed 10, 100, and 1000BASE-T environments. • Autonegotiating on 10/100/1000 ports automatically selects half- or full-duplex transmission mode to optimize bandwidth. • Dynamic Trunking Protocol (DTP) enables dynamic trunk configuration across all switch ports. • Port Aggregation Protocol (PAgP) automates the creation of Cisco Fast EtherChannel® groups or Gigabit EtherChannel groups to link to another switch, router, or server. • Link Aggregation Control Protocol (LACP) allows the creation of Ethernet channeling with devices that conform to IEEE 802.3ad. This feature is similar to Cisco EtherChannel technology and PAgP. • Auto-media-dependent interface crossover (MDIX) automatically adjusts transmit and receive pairs if an incorrect cable type (crossover or straight-through) is installed on a 10/100/1000 port. • IEEE 802.3z-compliant 1000BASE-SX, 1000BASE-LX/LH, 1000BASE-ZX, and 1000BASE-T physical interface support through a field-replaceable SFP module provides unprecedented flexibility in switch deployment. • DHCP Relay allows a DHCP relay agent to broadcast DHCP requests to the network DHCP server. • The default configuration stored in Flash memory ensures that the switch can be quickly connected to the network and can pass traffic with minimal user intervention.

All contents are Copyright © 1992–2003 Cisco Systems, Inc. All rights reserved. Important Notices and Privacy Statement.

Table 1 Product Features and Benefits (Continued)

Feature	Benefit
Availability and Scalability	
Superior Redundancy for Fault Backup	• Cisco UplinkFast and BackboneFast technologies help to ensure quick failover recovery, enhancing overall network stability and reliability. • IEEE 802.1w Rapid Spanning-Tree Protocol (RSTP) provides rapid spanning-tree convergence independent of spanning-tree timers. • Per-VLAN Rapid Spanning-Tree (PVRST+) allows rapid spanning-tree reconvergence on a per-VLAN spanning-tree basis, without requiring the implementation of spanning-tree instances. • Command-switch redundancy enabled in Cisco CMS Software allows designation of a backup command switch that takes over cluster management functions if the primary command switch fails. • Unidirectional Link Detection (UDLD) and Aggressive UDLD allow unidirectional links to be detected and disabled to avoid problems such as spanning-tree loops. • Switch port autorecovery (errdisable) automatically attempts to re-enable a link that is disabled due to a network error. • Cisco RPS 675 support provides superior power-source redundancy for up to 6 Cisco networking devices, resulting in improved fault tolerance and network uptime. • Bandwidth aggregation of up to 8 Gbps through Gigabit EtherChannel technology enhances fault tolerance and offers higher-speed aggregated bandwidth between switches, and to routers and individual servers. Integrated Cisco IOS Software features for bandwidth optimization • Per-port broadcast, multicast, and unicast storm control prevents faulty end stations from degrading overall systems performance. • IEEE 802.1d Spanning-Tree Protocol support for redundant backbone connections and loop-free networks simplifies network configuration and improves fault tolerance. • PVST+ allows for Layer 2 load sharing on redundant links to efficiently use the extra capacity inherent in a redundant design. • IEEE 802.1s Multiple Spanning-Tree Protocol (MSTP) allows a spanning-tree instance per VLAN, enabling Layer 2 load sharing on redundant links. • Local Proxy Address Resolution Protocol (ARP) works in conjunction with Private VLAN Edge to minimize broadcasts and maximize available bandwidth. • VLAN1 minimization allows VLAN1 to be disabled on any individual VLAN trunk link. • VLAN Trunking Protocol (VTP) pruning limits bandwidth consumption on VTP trunks by flooding broadcast traffic only on trunk links required to reach the destination devices. • Internet Group Management Protocol (IGMP) snooping provides fast client joins and leaves of multicast streams and limits bandwidth-intensive video traffic to only the requestors. • Multicast VLAN Registration (MVR) continuously sends multicast streams in a multicast VLAN while isolating the streams from subscriber VLANs for bandwidth and security reasons.

All contents are Copyright © 1992–2003 Cisco Systems, Inc. All rights reserved. Important Notices and Privacy Statement.

Table 1 Product Features and Benefits (Continued)

Feature	Benefit
QoS	
Advanced QoS	• 802.1p CoS and DSCP field classification are provided, using marking and reclassification on a per-packet basis by source and destination IP address, source and destination MAC address, or Layer 4 TCP/UDP port number. • Cisco control-plane and data-plane QoS ACLs on all ports help to ensure proper marking on a per-packet basis. • 4 egress queues per port enable differentiated management of up to 4 traffic types • Shaped Round Robin scheduling helps to ensure differential prioritization of packet flows by intelligently servicing the ingress and egress queues. • Weighted Tail Drop (WTD) provides congestion avoidance at the ingress and egress queues before a disruption occurs. • Strict priority queuing guarantees that the highest-priority packets are serviced ahead of all other traffic. • There is no performance penalty for highly granular QoS functions. Granular rate limiting • The Cisco Committed Information Rate (CIR) function guarantees bandwidth in increments as low as 8 Kbps. • Rate limiting is provided based on source and destination IP address, source and destination MAC address, Layer 4 TCP/UDP information, or any combination of these fields, using QoS ACLs (IP ACLs or MAC ACLs), class maps, and policy maps. • Asynchronous data flows upstream and downstream from the end station or on an uplink are easily managed using ingress policing and egress shaping. • Up to 64 aggregate or individual policers per Gigabit Ethernet port are allowed.

All contents are Copyright © 1992–2003 Cisco Systems, Inc. All rights reserved. Important Notices and Privacy Statement.

Table 1 Product Features and Benefits (Continued)

Feature	Benefit
Security	
Network-wide Security Features	• IEEE 802.1x allows dynamic, port-based security, providing user authentication. • IEEE 802.1x with VLAN assignment allows a dynamic VLAN assignment for a specific user, regardless of where the user is connected. • IEEE 802.1x with voice VLAN permits an IP phone to access the voice VLAN, regardless of the authorized or unauthorized state of the port. • IEEE 802.1x and port security are provided to authenticate the port and manage network access for all MAC addresses, including those of the client. • IEEE 802.1x with an ACL assignment allows for specific identity-based security policies, regardless of where the user is connected. • IEEE 802.1x with Guest VLAN allows guests without 802.1x clients to have limited network access on the Guest VLAN. • Cisco security VLAN ACLs (VACLs) on all VLANs prevent unauthorized data flows from being bridged within VLANs. • Port-based ACLs (PACLs) allow security policies to be applied on individual switch ports. • SSH Protocol, Kerberos, and SNMPv3 provide network security by encrypting administrator traffic during Telnet and SNMP sessions. SSH, Kerberos, and the cryptographic version of SNMPv3 require a special cryptographic software image due to U.S. export restrictions. • Private VLAN Edge provides security and isolation between switch ports, helping to ensure that users cannot snoop on other users' traffic. • Bidirectional data support on the Switched Port Analyzer (SPAN) port allows Cisco Secure Intrusion Detection System (IDS) to take action when an intruder is detected. • TACACS+ and RADIUS authentication enable centralized control of the switch and restrict unauthorized users from altering the configuration. • MAC address notification allows administrators to be notified of users added to or removed from the network. • Port security secures the access to an access or trunk port based on the MAC address. • After a specific timeframe, the aging feature removes the MAC address from the switch to allow another device to connect to the same port. • Trusted boundary provides the ability to trust the QoS priority settings if an IP phone is present and to disable the trust settings if the IP phone is removed, preventing a malicious user from overriding prioritization policies in the network. • Multilevel security on console access prevents unauthorized users from altering the switch configuration. • The user-selectable address-learning mode simplifies configuration and enhances security. • BPDU Guard shuts down Spanning-Tree Protocol PortFast-enabled interfaces when BPDUs are received to avoid accidental topology loops. • Spanning-Tree Root Guard (STRG) prevents edge devices not in the network administrator's control from becoming Spanning-Tree Protocol root nodes. • IGMP filtering provides multicast authentication by filtering out non-subscribers, and limits the number of concurrent multicast streams available per port. • Dynamic VLAN assignment is supported through implementation of the VLAN Membership Policy Server (VMPS) client function to provide flexibility in assigning ports to VLANs. Dynamic VLAN enables the fast assignment of IP addresses. • Cisco CMS Software security wizards ease the deployment of security features for restricting user access to a server, to a portion of the network, or to the entire network. • 1000 security access control entries are supported.

All contents are Copyright © 1992–2003 Cisco Systems, Inc. All rights reserved. Important Notices and Privacy Statement.

Table 1 Product Features and Benefits (Continued)

Feature	Benefit
Manageability	
Superior Manageability	• Cisco IOS CLI support provides a common user interface and command set with all Cisco routers and Cisco Catalyst desktop switches. • Cisco Service Assurance Agent (SAA) support facilitates service-level management throughout the LAN. • VLAN trunks can be created from any port, using either standards-based 802.1Q tagging or the Cisco Inter-Switch Link (ISL) VLAN architecture. • Up to 1024 VLANs per switch and up to 128 spanning-tree instances per switch are supported. • 4000 VLAN IDs are supported. • Voice VLAN simplifies telephony installations by keeping voice traffic on a separate VLAN for easier administration and troubleshooting. • Cisco VTP supports dynamic VLANs and dynamic trunk configuration across all switches. • IGMP snooping provides fast client joins and leaves of multicast streams and limits bandwidth-intensive video traffic to only the requestors. • Remote Switch Port Analyzer (RSPAN) allows administrators to remotely monitor ports in a Layer 2 switch network from any other switch in the same network. • For enhanced traffic management, monitoring, and analysis, the Embedded Remote Monitoring (RMON) software agent supports 4 RMON groups (history, statistics, alarms, and events). • Layer 2 traceroute eases troubleshooting by identifying the physical path that a packet takes from source to destination. • All 9 RMON groups are supported through a SPAN port, which permits traffic monitoring of a single port, a group of ports from a single network analyzer, or RMON probe. • The Domain Name System (DNS) provides IP address resolution with user-defined device names. • Trivial File Transfer Protocol (TFTP) reduces the cost of administering software upgrades by downloading from a centralized location. • Network Timing Protocol (NTP) provides an accurate and consistent timestamp to all intranet switches. • Multifunction LEDs per port for port status; half-duplex and full-duplex mode; 10-, 100-, and 1000-BASE-T indication; and switch-level status LEDs for system, redundant-power supply, and bandwidth utilization provide a comprehensive and convenient visual management system.

All contents are Copyright © 1992–2003 Cisco Systems, Inc. All rights reserved. Important Notices and Privacy Statement.

Table 1 Product Features and Benefits (Continued)

Feature	Benefit
Cisco CMS Software	• Cisco CMS Software provides an easy-to-use, Web-based management interface through a standard Web browser. • Cisco AVVID wizards need just a few user inputs to automatically configure the switch to optimally handle different types of traffic: voice, video, multicast, and high-priority data. • A security wizard is provided to restrict unauthorized access to applications, servers, and networks. • Cisco CMS Software allows management of up to 16 interconnected Cisco Catalyst 3750, 3550, 2970, 2950, 2950 LRE, 2940, 3500 XL, 2900 XL, 2900 LRE XL, and 1900 Series switches through a single IP address, without the limitation of being physically located in the same wiring closet. • The Cisco CMS Software upgrade feature allows one-click software upgrade across an entire cluster of Cisco Catalyst 3750, 3550, 2970, 2950, 2950 LRE, 2940, 3500 XL, 2900 XL, 2900 LRE XL, and 1900 Series switches. Configuration cloning enables rapid deployment of networks. • Cisco CMS Software has been extended to include multilayer feature configurations such as routing protocols, ACLs, and QoS parameters. • Cisco CMS Software Guide Mode assists in the configuration of powerful advanced features by providing step-by-step instructions. • Cisco CMS Software provides enhanced online help for context-sensitive assistance. • The easy-to-use graphical interface provides both a topology map and front-panel view of the cluster. • Multidevice and multiport configuration capabilities allow administrators to save time by configuring features across multiple switches and ports simultaneously. • Web-based management for a Cisco Aironet® Wireless Access Point is launched by clicking the relevant icon in the topology map. • The user-personalized interface allows modification of polling intervals, table views, and other settings within Cisco CMS Software and retains these settings. • Alarm notification provides automated e-mail notification of network errors and alarm thresholds.
Express Setup	• Express Setup simplifies initial configuration of a switch through a Web browser, eliminating the need for more complex terminal emulation programs and CLI knowledge. • The Web interface enables less-skilled personnel to quickly and simply set up switches, thereby reducing the cost of deployment.
CiscoWorks Support	• CiscoWorks network-management software provides management capabilities on a per-port and per-switch basis, providing a common management interface for Cisco routers, switches, and hubs. • SNMP v1, v2c, and v3 and Telnet interface support deliver comprehensive in-band management, and a CLI-based management console provides detailed out-of-band management. • Cisco Discovery Protocol versions 1 and 2 enable a CiscoWorks network-management station for automatic switch discovery. • Supported by the CiscoWorks 2000 LAN Management solution.

All contents are Copyright © 1992–2003 Cisco Systems, Inc. All rights reserved. Important Notices and Privacy Statement.

Product Specifications

Table 2 Hardware

Description	Specification
Performance	• Forwarding bandwidth: 28 Gbps (Cisco Catalyst 2970G-24TS), 24 Gbps (Cisco Catalyst 2970G24T) • Forwarding rate based on 64-byte packets: 38.7 Mpps (Cisco Catalyst 2970G-24TS), 35.7 Mpps (Cisco Catalyst 2970G-24T) • 128 MB DRAM and 16 MB Flash memory • Configurable up to 8000 MAC addresses • Configurable up to 1000 IGMP groups and bridging entries • Configurable maximum transmission unit (MTU) of up to 9018 bytes (jumbo frames) for bridging on Gigabit Ethernet ports, and up to 1546 bytes for bridging on Fast Ethernet ports
Connectors and Cabling	• 10BASE-T ports: RJ-45 connectors; 2-pair Category 3, 4, or 5 unshielded twisted-pair (UTP) cabling • 100BASE-TX ports: RJ-45 connectors; 2-pair Category 5 UTP cabling • 1000BASE-T ports: RJ-45 connectors; 2-pair Category 5 UTP cabling • 1000BASE-T SFP-based ports: RJ-45 connectors, 2-pair Category 5 UTP cabling • 1000BASE-SX, -LX/LH, -ZX, and CWDM SFP-based ports: LC fiber connectors (single-mode or multimode fiber) • Management console port: RJ-45-to-DB9 cable for PC connections
Power Connectors	• Customers can provide power to a switch by using either the internal power supply or the Cisco RPS 675. The connectors are located at the back of the switch.
Internal Power Supply Connector	• The internal power supply is an autoranging unit. • The internal power supply supports input voltages between 100 and 240 VAC. • Use the supplied AC power cord to connect the AC power connector to an AC power outlet.
Cisco RPS 675 Connector	• Offers connection for an optional Cisco RPS 675 that uses AC input and supplies DC output to the switch. • Offers a 675W RPS that supports up to 6 external network devices and provides power to 1 failed device at a time. • Automatically senses when the internal power supply of a connected device fails and provides power to the failed device, preventing loss of network traffic. • Only the Cisco RPS 675 (model PWR675-AC-RPS-N1=) should be attached to the RPS receptacle.
Indicators	• Per-port status LEDs: link integrity, disabled, activity, speed, and full-duplex indications • System-status LEDs: system, RPS, and bandwidth-utilization indications
Dimensions (H x W x D)	• 2.59 x 17.5 x 11.6 in. (6.59 x 44.5 x 29.5 cm) (Cisco Catalyst 2970G-24TS) • 1.73 x 17.5 x 12.83 in. (4.39 x 44.5 x 32.6 cm) (Cisco Catalyst 2970G-24T)
Weight	• 12.5 lb (5.68 kg) (Cisco Catalyst 2970G-24TS) • 10 lb (4.55 kg) (Cisco Catalyst 2970G-24T)

All contents are Copyright © 1992–2003 Cisco Systems, Inc. All rights reserved. Important Notices and Privacy Statement.

Table 2 Hardware (Continued)

Description	Specification
Environmental Ranges	• Operating temperature: 32 to 113ºF (0 to 45ºC) • Storage temperature: –13 to 158ºF (–25 to 70ºC) • Operating relative humidity: 10 to 85 percent (noncondensing) • Operating altitude: Up to 10,000 ft (3049 m) • Storage altitude: Up to 15,000 ft (4573 m)
Acoustic Noise	• International Organization for Standardization (ISO) 7779: Bystander position operating to an ambient temperature of 30ºC • Cisco Catalyst 2970G-24TS: 42 dB • Cisco Catalyst 2970G-24T: 42 dB
Predicted Mean Time Between Failure (MTBF)	• 163,222 hrs (Cisco Catalyst 2970G-24TS) • 219,108 hrs (Cisco Catalyst 2970G-24T)

Table 3 Power Specification

Description	Specification
Power Consumption	• 190W (maximum), 650 Btus per hour (Cisco Catalyst 2970G-24TS) • 160W (maximum), 445 Btus per hour (Cisco Catalyst 2970G-24T)
AC Input Voltage/ Frequency	• 100 to 127 or 200 to 240 VAC (autoranging), 50 to 60 Hz
DC Input Voltages	• RPS input • +12V at 17A (Cisco Catalyst 2970G-24TS) • +12V at 13A (Cisco Catalyst 2970G-24T)

All contents are Copyright © 1992–2003 Cisco Systems, Inc. All rights reserved. Important Notices and Privacy Statement.

Table 4 Management and Standards Support

Description	Specification
Management Information Base (MIB) Support	• BRIDGE-MIB (RFC1493) • CISCO-CDP-MIB • CISCO-CLUSTER-MIB • CISCO-CONFIG-MAN-MIB • CISCO-ENTITY-FRU-CONTROL-MIB • CISCO-ENVMON-MIB • CISCO-FLASH-MIB • CISCO-FTP-CLIENT-MIB • CISCO-IGMP-FILTER-MIB • CISCO-IMAGE-MIB • CISCO IP-STAT-MIB • CISCO-MAC-NOTIFICATION-MIB • CISCO-MEMORY-POOL-MIB • CISCO-PAGP-MIB • CISCO-PING-MIB • CISCO-PROCESS-MIB • CISCO-RTTMON-MIB • CISCO-STP-EXTENSIONS-MIB • CISCO-SYSLOG-MIB • CISCO-TCP-MIB • CISCO-VLAN-IFTABLE-RELATIONSHIP-MIB • CISCO-VLAN-MEMBERSHIP-MIB • CISCO-VTP-MIB • ENTITY-MIB • ETHERLIKE-MIB • IF-MIB (in and out counters for VLANs are not supported) • IGMP-MIB • OLD-CISCO-CHASSIS-MIB • OLD-CISCO-FLASH-MIB • OLD-CISCO-INTERFACES-MIB • OLD-CISCO-IP-MIB • OLD-CISCO-SYS-MIB • OLD-CISCO-TCP-MIB • OLD-CISCO-TS-MIB • RFC1213-MIB (per the agent capabilities specified in the CISCO-RFC1213-CAPABILITY.my) • RFC1253-MIB • RMON-MIB • RMON2-MIB • SNMP-FRAMEWORK-MIB • SNMP-MPD-MIB • SNMP-NOTIFICATION-MIB • SNMP-TARGET-MIB • SNMPv2-MIB • TCP-MIB • UDP-MIB

All contents are Copyright © 1992–2003 Cisco Systems, Inc. All rights reserved. Important Notices and Privacy Statement.

Table 4 Management and Standards Support (Continued)

Description	Specification
Standards	• IEEE 802.1s • IEEE 802.1w • IEEE 802.1x • IEEE 802.3ad • IEEE 802.3x full duplex on 10BASE-T, 100BASE-TX, and 1000BASE-T ports • IEEE 802.1D Spanning-Tree Protocol • IEEE 802.1p CoS Prioritization • IEEE 802.1Q VLAN • IEEE 802.3 10BASE-T specification • IEEE 802.3u 100BASE-TX specification • IEEE 802.3ab 1000BASE-T specification • IEEE 802.3z 1000BASE-X specification • 1000BASE-X (SFP) • 1000BASE-SX • 1000BASE-LX/LH • 1000BASE-ZX • RMON I and II standards • SNMPv1, SNMPv2c, and SNMPv3

Table 5 Safety and Compliance

Description	Specification
Safety Certifications	• UL to UL 60950, Third Edition • C-UL to CAN/CSA C22.2 No. 60950-00, Third Edition • TUV/GS to EN 60950:2000 • CB to IEC 60950 with all country deviations • NOM to NOM-019-SCFI • CE Marking
Electromagnetic Emissions Certifications	• FCC Part 15 Class A • EN 55022: 1998 (CISPR22) • EN 55024: 1998 (CISPR24) • VCCI Class A • AS/NZS 3548 Class A • CE • CNS 13438 Class A • MIC
Telecommunications	• CLEI code
Warranty	• Limited lifetime warranty

All contents are Copyright © 1992–2003 Cisco Systems, Inc. All rights reserved. Important Notices and Privacy Statement.

Service and Support

Cisco is committed to minimizing total cost of ownership, and offers a portfolio of Technical Support Services to help ensure that Cisco products operate efficiently, remain highly available, and benefit from the most up-to-date system software. The services and support programs described in the table below are available as part of the Cisco Desktop Switching Service and Support solution, and are available directly from Cisco and through resellers.

Table 6 Service and Support

Service and Support	Features	Benefits
Advanced Services		
Cisco Total Implementation Solutions (TIS), available direct from Cisco Cisco Packaged TIS, available through resellers	• Project management • Site survey, configuration, and deployment • Installation, text, and cutover • Training • Major moves, adds, and changes • Design review and product staging	• Supplements existing staff • Helps to ensure that functions meet needs • Mitigates risk
Technical Support Services		
Cisco SMARTnet® and SMARTnet Onsite services, available direct from Cisco. Cisco Packaged SMARTnet service, available through resellers	• 24-hour access to software updates • Web access to technical repositories • Telephone support through the Cisco Technical Assistance Center (TAC) • Advance replacement of hardware parts	• Enables proactive or expedited issue resolution • Lowers total cost of ownership by taking advantage of Cisco expertise and knowledge • Minimizes network downtime

All contents are Copyright © 1992–2003 Cisco Systems, Inc. All rights reserved. Important Notices and Privacy Statement.

Ordering Information

Table 7 Ordering Information

Part Number	Description
WS-C2970G-24TS-E	• 24 Ethernet 10/100/1000 ports and 4 SFP-based Gigabit Ethernet ports • 1.5 RU standalone, multilayer switch • Enhanced Image Software with intelligent multilayer services
WS-C2970G-24T-E	• 24 Ethernet 10/100/1000 ports • 1 RU standalone, multilayer switch • Enhanced Image Software with intelligent multilayer services
RCKMNT-1RU=	• Spare rack-mount kit for the Cisco Catalyst 2970G-24T-E
RCKMNT-3550-1.5RU=	• Spare rack-mount kit for the Cisco Catalyst 2970G-24TS-E
GLC-ZX-SM=	• GE SFP, LC connector ZX transceiver (extended distance)
GLC-LH-SM=	• GE SFP, LC connector LH transceiver (long wavelength/long haul)
GLC-SX-MM=	• GE SFP, LC connector SX transceiver (short wavelength)
GLC-T=	• GE SFP, RJ-45 connector 1000BASET

For More Information

For more information about Cisco products, contact:

- United States and Canada (toll-free): 800 553-NETS (6387)
- Europe: 32 2 778 4242
- Australia: 612 9935 4107
- Other: 408 526-7209
- http://www.cisco.com

All contents are Copyright © 1992–2003 Cisco Systems, Inc. All rights reserved. Important Notices and Privacy Statement.

Corporate Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters
Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters
Cisco Systems, Inc.
Capital Tower
168 Robinson Road
#22-01 to #29-01
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

Cisco Systems has more than 200 offices in the following countries and regions. Addresses, phone numbers, and fax numbers are listed on the

Cisco Web site at www.cisco.com/go/offices

Argentina • Australia • Austria • Belgium • Brazil • Bulgaria • Canada • Chile • China PRC • Colombia • Costa Rica • Croatia
Czech Republic • Denmark • Dubai, UAE • Finland • France • Germany • Greece • Hong Kong SAR • Hungary • India • Indonesia • Ireland
Israel • Italy • Japan • Korea • Luxembourg • Malaysia • Mexico • The Netherlands • New Zealand • Norway • Peru • Philippines • Poland
Portugal • Puerto Rico • Romania • Russia • Saudi Arabia • Scotland • Singapore • Slovakia • Slovenia • South Africa • Spain • Sweden
Switzerland • Taiwan • Thailand • Turkey • Ukraine • United Kingdom • United States • Venezuela • Vietnam • Zimbabwe

All contents are Copyright © 1992–2003 Cisco Systems, Inc. All rights reserved. CCIP, CCSP, the Cisco Arrow logo, the Cisco *Powered* Network mark, Cisco Unity, Follow Me Browsing, FormShare, and StackWise are trademarks of Cisco Systems, Inc.; Changing the Way We Work, Live, Play, and Learn, and iQuick Study are service marks of Cisco Systems, Inc.; and Aironet, ASIST, BPX, Catalyst, CCDA, CCDP, CCIE, CCNA, CCNP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, the Cisco IOS logo, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Empowering the Internet Generation, Enterprise/Solver, EtherChannel, EtherSwitch, Fast Step, GigaStack, Internet Quotient, IOS, IP/TV, iQ Expertise, the iQ logo, iQ Net Readiness Scorecard, LightStream, MGX, MICA, the Networkers logo, Networking Academy, Network Registrar, *Packet*, PIX, Post-Routing, Pre-Routing, RateMUX, Registrar, ScriptShare, SlideCast, SMARTnet, StrataView Plus, Stratm, SwitchProbe, TeleRouter, The Fastest Way to Increase Your Internet Quotient, TransPath, and VCO are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the U.S. and certain other countries.

All other trademarks mentioned in this document or Web site are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0304R)

ETMG 203070—GM 07.03